

REMARKS

The Examiner is thanked for the due consideration given the application.

Claims 1-8 and 12 are pending in the application. Claims 1-7 have been withdrawn. Independent Claim 8 has been amended to reflect the clamping frame of Figures 7-14. Claims 9-11 and 13-16 have been canceled. Claim 12 has been amended to better conform with claim 8.

In particular, amended claim 8 sets forth the mold and clamping frame assembly of Figures 7-14 comprising the relevant distinctive feature of Figure 9, according to which the pneumatic clamping frame comprises two air suction slots 27 and an intermediate baffle or partition wall 28 to allow a strong double pneumatic sheet holding force, due to penetration of partition 28 into the heated plastic material and penetration of the front face of the plasticized sheet in large slots, as will be explained further on. Support for the amendments to claim 8 can also be found in the specification at page 13, lines 13-20, at page 8, lines 1-5 and lines 20-24, at page 12, lines 17-23, at page 15, lines 22-24, at pages 10, 11, 13 and 19, and in claims 13 and 16.

No new matter is believed to be added to the application by this amendment.

Art Rejections

Claim 8 has been rejected under 35 USC §102(b) as being anticipated by BREITLING (DE 24 18 445). Claims 8-10, 12 and 15 have been rejected under 35 USC §103(a) as being unpatentable over PETERSON (U.S. Patent 6,361,304) in view of KOTHA (U.S. Patent 6,063,326). Claims 11, 13 and 14 have been rejected under 35 USC §103(a) as being unpatentable over PETERSON in view of KOTHA, and further in view of VAUGHN (WO 99/64221). Claim 16 has been rejected under 35 USC §103(a) as being unpatentable over PETERSON in view of KOTHA, and further in view of VAUGHN, in further view of JENKINS (U.S. Patent 5,529,472) and GROLLA (DE 26 30 021).

These rejections are respectfully traversed.

The present invention, as amended, pertains to a mold and clamping frame assembly depicted in Figures 7-14 of the application. Amended independent claim 8 of the present invention recites:

8. A mold and clamping frame assembly configured for the manufacture of a vacuum thermoformed body from a plastic sheet, comprising:

- a thermoforming mold having a sheet shaping surface, a peripheral edge and an outer step backward from the peripheral edge;
- a sheet clamping frame peripherally extending all around the mold (11);
- a support frame and a first control means conformed to move the clamping frame between a raised

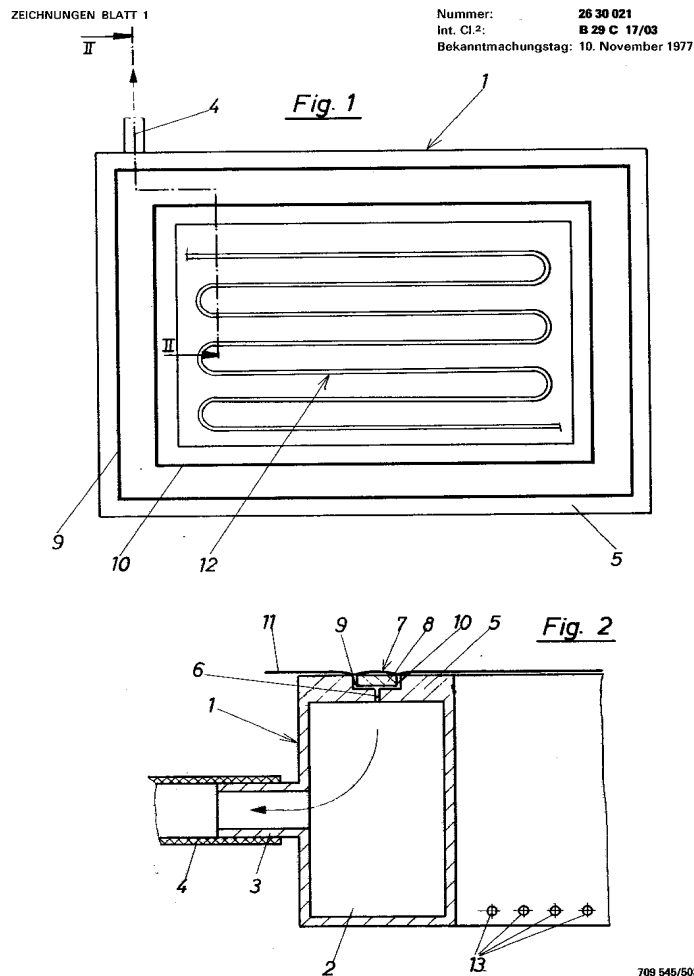
position above the mold and a lowered position on the outer step backward from the edge of the mold;

- in which the clamping frame comprises at least first and second frame members movable in relation to each other, and a second control means operatively connected to the frame members to selectively change their disposition and geometric configuration of the clamping frame, to pre-shape and conform the plastic sheet to the shaping surface of the mold in the raised position of the clamping frame;

the clamping frame comprises two parallel extending top-open air-suction slots having a bottom wall, the suction slots being spaced apart by an intermediate baffle; and

each suction slot comprises a bar having a width smaller than and spaced apart from the bottom wall, to provide narrow air passages in communication with an air suction manifold by suction holes.

In light of instant claim 8 of the present invention, it is informative to first consider GROLLA. Figures 9 and 10 of GROLLA are reproduced below.



The present invention differs from GROLLA in that:

i) In GROLLA, two restricted suction slots 9 and 10 are spaced apart by a large bar 8 for supporting the plastic sheet 11 flush to the upper surface of the mold, and the vacuum clamping device is integral with the same mold. No possibility exists in GROLLA to move the clamping device in respect to the mold, and to pre-shape the heated plastic sheet, by changing the geometry of the same clamping device, in conformity with the shape of the mold.

ii) Furthermore, due to the conformation of the vacuum clamping device, GROLLA is suitable for clamping plastic sheets of very thin thickness. There is practically no possibility for plastic sheets of greater thickness, in molding articles having complex geometrical shapes, for which a strong vacuum clamping force is required.

iii) Conversely, according to the present invention and in conformity with amended claim 8, the claimed assembly is suitable:

a) to pre-shape the heated plastic sheet, to prevent stretching and to control the thickness of the molded articles;

b) to conform the clamping frame to the shape of the mold when moved from a raised to a lowered position;

c) to provide a strong vacuum clamping force due to deep penetration of the plasticized sheet material into large slots between the side walls and the intermediate partition, by the strong suction force caused by the Venturi configuration of Figure 9 of the present invention, which is reproduced below.

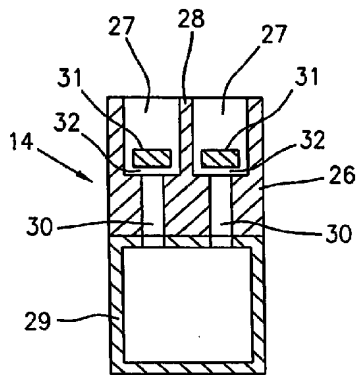


Fig. 9

Although the Venturi effect is a well known effect, Figure 9 of present application provided a simple solution that is not made obvious or suggested by GROLLA.

None of the cited documents taken alone or in combination describes or makes unpatentable the present invention, according to instant claim 8.

For Example, VAUGHN merely discloses sheet support members 11, movably seated into channels of the mold, and merely urged by springs during seaming of the superimposed plastic sheets; no possibility exists to change the geometric shape of the support members and to pre-shape the plastic sheet; use of a channel shaped vacuum seal (see Figure 2, below) is merely suggested to retain the plastic sheet.

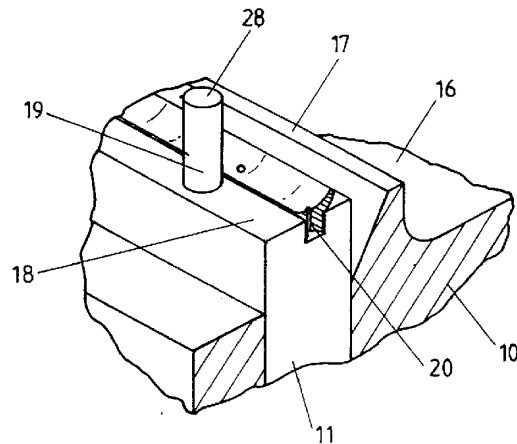


FIG. 2

JENKINS discloses a conventional vacuum molding apparatus, in which the plastic sheet is clamped against the mold, by clamping members urging the edges of the sheet against the upper edges of the mold.

It is also clear that PETERSEN and KOTHA do not pertain to instant claim 8 of present invention, as is discussed below.

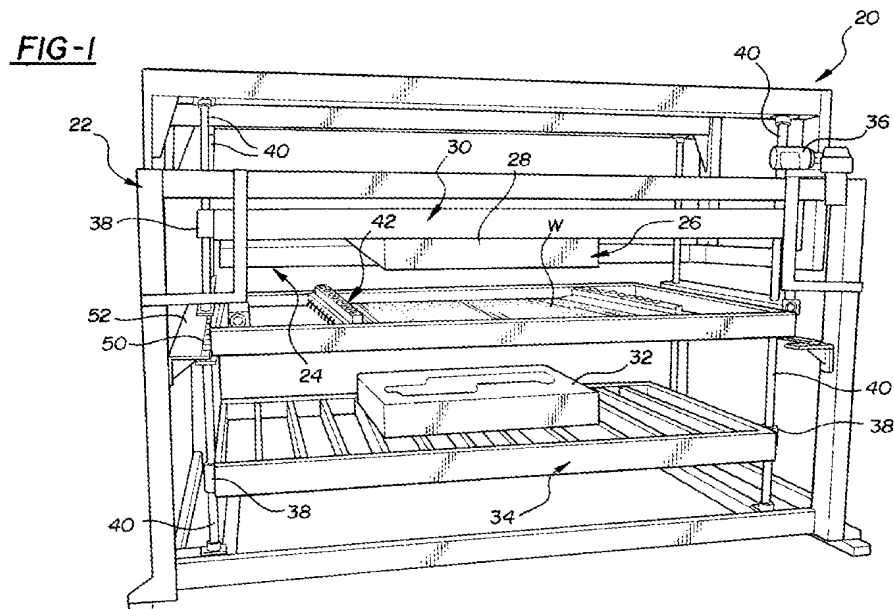
In claim 8 of the present invention, the clamping frame is provided on a support frame to be moved between an upper and a lower position, in respect to the mold. The clamping frame includes movable frame members that may change their disposition to vary the geometry of the clamping frame, by moving from a planar disposition for heating the plastic sheet, to a disposition in which the heated sheet is firstly pre-shaped in conformity with the surface of the mold, and then lowered to allow vacuum forming into the mold.

According to present invention, the independent movement of the frame members changes the shape and geometry of the clamping frame to pre-shape the plastic sheet in conformity with the shaping surface of the mold, while the movement of the clamping frame is required to bring the pre-shaped plastic sheet against the shaping surface of the mold.

None of this is disclosed or suggested by PETERSEN.

PETERSEN does not disclose an apparatus, or more properly a mold and clamping frame assembly according to present invention, and does not allow any pre-shaping of the heated plastic sheet to conform the same sheet to the surface of the mold.

PETERSEN cannot be combined with KOTHA or any other reference. Figure 1 of PETERSEN is reproduced below.

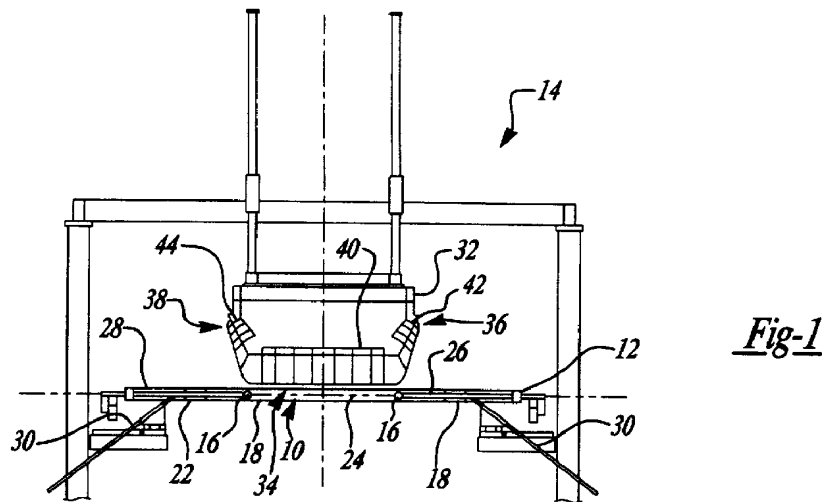


As can be seen, PETERSEN discloses a conventional thermoforming apparatus that includes a central molding station provided with an upper die member 26 and with a lower mold member 32 both vertically movable to approach each other (column 4, lines 46-64). Petersen disclose also the use of a sheet clamping frame (42) (column 4, lines 64-67 and column 5) to seam the plastic sheet W. The clamping frame is supported by shelves 52 indexable to horizontally move between a molding station and an oven 24 arranged at the rear side. The clamping frame includes longitudinal and cross bar members for independent movement (column 5), to define a rectangular window aperture corresponding to the dimension of the plastic sheets to be molded (see column 10 - OPERATION - and column 11).

At column 11, lines 34-37 PETERSEN suggests to move the longitudinal and cross bar elements on a common plane such that there is no distortion of the edge of the workpiece W during molding. The workpiece W therefore, according to this conventional technology, must be kept in a planar condition. No pre-shaping and vertical movement of the pre-shaped sheet is suggested or described in PETERSEN, and no combination of PETERSEN with KOTHA is therefore made possible.

In KOTHA, the forming press 14 (column 3, line 49) includes a vertically movable mold and clamping frame 12 having a stationary center frame section 18, and pivotable side sections 24, 28. A lifter 30 is provided to merely rotate the side

sections of the clamping frame. This can be readily seen in Figure 1 of KOTHA, which is reproduced below.



Therefore, the combination of both clamping frames structurally and functionally is not made possible.

The Official Action is thus confusingly and improperly comparing the lifter 30 of KOTHA to rotate the side sections of the frame 12, with the support means of the present invention for moving the entire clamping frame, after the pre-shaping step of the plastic sheet, from the raised to the lowered position against the shaping surface of the mold.

In Summary, none of the applied art references, alone or in combination, anticipate or render *prima facie* unpatentable a claimed embodiment of the present invention.

These rejections are believed to be overcome, and withdrawal thereof is respectfully requested.

CONCLUSION

The issuance of a Notice of Allowability is respectfully solicited.

The Commissioner is hereby authorized in this, concurrent, and future submissions, to charge any deficiency or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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